

### **DETAILED ACTION**

1. This communication is responsive to Amendment filed 12/06/2007.

As a result of the amendment, claims 1, 15, 25 have been amended. Claims 1-25 are pending in the application.

### **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicant's representative, Jerome G. Schaefer, on March 11, 2008.

The application has been amended as follows:

### **AMENDMENTS TO THE SPECIFICATION**

Amend the paragraph starting at page 6, line 24-26 as shown below:

Communication media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media.

### **AMENDMENT TO THE DRAWINGS**

The Patent and Trademark Office no longer makes drawing changes. See 1017 O.G. 4. It is applicant's responsibility to ensure that the drawings are corrected. Corrections must be made in accordance with the instructions below.

The following changes to the drawings have been approved by the examiner and agreed upon by applicant.

Fig. 6, reference 604: "Forc" is changed to Force

Fig. 7, reference 702: "Call to be mad" is changed to Call to be made

In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

The Patent and Trademark Office no longer makes drawing changes. See 1017 O.G. 4. It is applicant's responsibility to ensure that the drawings are corrected. Corrections must be made in accordance with the instructions below.

## **INFORMATION ON HOW TO EFFECT DRAWING CHANGES**

### **Replacement Drawing Sheets**

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not

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been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

### **Annotated Drawing Sheets**

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

### **Timing of Corrections**

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

### **AMENDMENTS TO THE CLAIMS:**

- **Cancel claim 6.**
- **Claim 1 has been amended as:**

A system for optimizing recovery logging, the system comprising:

a log storage device on a calling component machine;

a calling component module on the calling component machine, wherein the storage device stores a stable log associated with the calling component, the calling

component module adapted to sending a first message to a called component of a plurality of called components receiving calls from the calling component module, wherein a contract between the calling component module and the called component requires the called component to guarantee persistence of its last return message to the calling component module until released by receiving a second message from the calling component module, wherein the calling component sends the first message without logging the first message to the log storage device, and wherein the calling component module is adapted to sending a second message to the called component, and logging a first return message to the log storage device when the second message to the called component is sent, wherein logging of the first return message on the log storage device is an only forced logging event on the calling component module enabling optimized recovery of incomplete requests in event of a system crash based on logged messages on the calling component module and the called component; and

a called component table on the calling component machine for storing information associated with the first return message, wherein the called component determines whether the first return message received from the called component has been stably logged, the determination comprises:

(a) in response to determining that an entry for the called component is not in a table of information associated with called components, adding an entry for the first message to the table, the entry comprising an identifier for the called component, and a log sequence number set to a lowest possible value;

(b) in response to determining that the entry for the called component is in the table of information associated with called components, comparing a highest stably logged log sequence number with the log sequence number in the table entry, wherein:

(i) in response to determining that the highest stably logged log sequence number is greater than the log sequence number in the entry, proceeding to call the called component without forcing the log;

(ii) in response to determining that the highest stably logged log sequence number is less than the log sequence number in the table entry, forcing the log so that the highest stably logged record has a higher log sequence number than the table entry; and

(iii) updating the highest stably logged log sequence number to a highest log sequence number written to the stable log.

- **Claim 4 has been amended as:**

The system of claim 3, wherein the status of the first return message is determined by comparing the highest log sequence number written to memory and the highest log sequence number written to the storage device and a log sequence number associated with the called component.

- **Cancel claims 16-20.**
- **Claim 15 has been amended as:**

A method of recovery logging comprising:

determining whether a first return message received from a called component has been stably logged on a called component machine, wherein a contract between a calling component, having a log storage device, and the called component requires the called component to guarantee persistence of its last return message to the calling component until released by receiving a second message from the calling component, wherein logging of the first return message on the log storage device is an only forced logging event on the calling component, wherein the first return message is received in response to a first message sent from the calling component to the called component, wherein the calling component resides on a calling component machine different than the called component machine;

in response to determining that the first return message has not been stably logged, logging at least the first message to a stable log on the called component before a second message is sent to the calling component, wherein the logging enables recovery of incomplete requests in event of a system crash;

wherein the step of determining whether the first return message received from the called component has been stably logged comprises:

(a) in response to determining that an entry for the called component is not in a table of information associated with called components, adding an entry for the first message to the table, the entry comprising an identifier for the called component, and a log sequence number set to a lowest possible value;

(b) in response to determining that the entry for the called component is in the table of information associated with called components, comparing a highest stably logged log sequence number with the log sequence number in the table entry, wherein:

(i) in response to determining that the highest stably logged log sequence number is greater than the log sequence number in the entry, proceeding to call the called component without forcing the log;

(ii) in response to determining that the highest stably logged log sequence number is less than the log sequence number in the table entry, forcing the log so that the highest stably logged record has a higher log sequence number than the table entry; and

(iii) updating the highest stably logged log sequence number to a highest log sequence number written to the stable log.

- **Claim 25 has been amended as:**

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A computer-readable storage medium including computer-executable instructions for:

sending a first call message to a called component from a calling component, wherein a contract between the calling component and the called component requires the called component to guarantee persistence of its last return message to the calling component until released by receiving a second message from the calling component, wherein logging of the first return message on the log storage device is an only forced logging event on the calling component;

sending a second call message to the called component from the calling component;

logging a first return message to the first call message in a stable log on the called component machine;

logging the first return message to the first call message in a stable log on a log storage device of the calling component machine when the second call message to the called component is sent; and

determining whether the first return message received from the called component has been stably logged on a called component machine;

wherein the step of determining comprises:



(a) in response to determining that an entry for the called component is not in a table of information associated with called components, adding an entry for the first call message to the table, the entry comprising an identifier for the called component, and a log sequence number set to a lowest possible value;

(b) in response to determining that the entry for the called component is in the table of information associated with called components, comparing a highest stably logged log sequence number with the log sequence number in the table entry, wherein:

(i) in response to determining that the highest stably logged log sequence number is greater than the log sequence number in the entry, proceeding to call the called component without forcing the log;

(ii) in response to determining that the highest stably logged log sequence number is less than the log sequence number in the table entry, forcing the log so that the highest stably logged record has a higher log sequence number than the table entry; and

(iii) updating the highest stably logged log sequence number to a highest log sequence number written to the stable log.

### ***Reasons for Allowance***

3. Claims 1-5, 7-15, 21-25, now renumbered as 1-19, are allowable over the prior arts of record.

4. The following is a statement of reasons for the indication of allowable subject matter:

The present invention is directed to a method, system of optimizing committed contracts.

**Claim 1** recites, or similarly recites, in combination with the remaining elements, the steps of:

*a contract between the calling component module and the called component requires the called component to guarantee persistence of its last return message to the calling component module until released by receiving a second message from the calling component module;*

*wherein logging of the first return message on the log storage device is an only forced logging event on the calling component module enabling optimized recovery of incomplete requests in event of a system crash based on logged messages on the calling component module and the called component;*

*determining whether the first return message received from the called component has been stably logged on a called component machine, as detailed in steps (a), (b),( i), (ii), (iii).*

The closest prior art, Lomet et al. (U.S. Pat. 6,182,086) shows a substantially similar method that provides a client/server computer system in which multiple clients are connected to a server and in which a resource manager creates a stable log on the server that enables application and database recovery (Summary). While Lomet

discloses one forced logging event on the called component for each message exchange (Abstract and Summary), Lomet does not disclose that for every two exchanges, which includes the calling component sends the first message without logging the first message to the log storage device, there is an only forced logging event on the calling component, as recited in claim 1. Furthermore, Cotner et al. (US Pat. No. 5,884,327), discloses an analogous system and method that utilizes a two-phase commit protocol to ensure data consistency among participants in a transaction. However, Lomet et al. and Cotner et al., singularly or in combination, fail to anticipate or render the above cited limitations obvious.

**Claim 25** is a computer-readable storage medium including computer-executable instructions for operating the system of claim 1, under the same reasons as set forth above, claim 25 is allowable over the prior arts of records.

**Claim 15** recites, or similarly recites, in combination with the remaining elements, the steps of:

*a contract between a calling component, having a log storage device, and the called component requires the called component to guarantee persistence of its last return message to the calling component until released by receiving a second message from the calling component; wherein logging of the first return message on the log storage device is an only forced logging event on the calling component.*

*a determination whether the first return message received from the called component has been stably logged on a called component machine, as detailed in steps (a), (b), (i), (ii), (iii).*

The closest prior art, Shoaib et al. (U.S. Pat. 7,152,180) shows a substantially similar reliable messaging system that is capable of configurably logging the message, detecting a plurality of failures, notifying a remote entity interconnected with the configurable reliable messaging system via the network of the plurality of failures, and recovering from the plurality of failures (Summary), and Cotner et al. (US Pat. No. 5,884,327) discloses an analogous system and method that utilizes a two-phase commit protocol to ensure data consistency among participants in a transaction; but both Shoaib et al. and Cotner et al., singularly or in combination, fail to anticipate or render the above cited limitations obvious.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham, can be reached on 571-272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is 571-272-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Miranda Le/

Primary Examiner, Art Unit 2167

March 13, 2008